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Citizens' Bulletin

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The Connecticut Department of Environmental Protection

Hazardous Wastes

The problem in everybody's backyard

Citizens' Bulletin
September 1986
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Cover by Michael D. Klein

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Editor's Note

This September issue of the *Citizens' Bulletin* marks the beginning of another year of publication. For those of our readers who have been with us for a while, welcome back. For our new readers, thanks for signing on. We think you'll like the *Bulletin* and what you will find out about Connecticut.

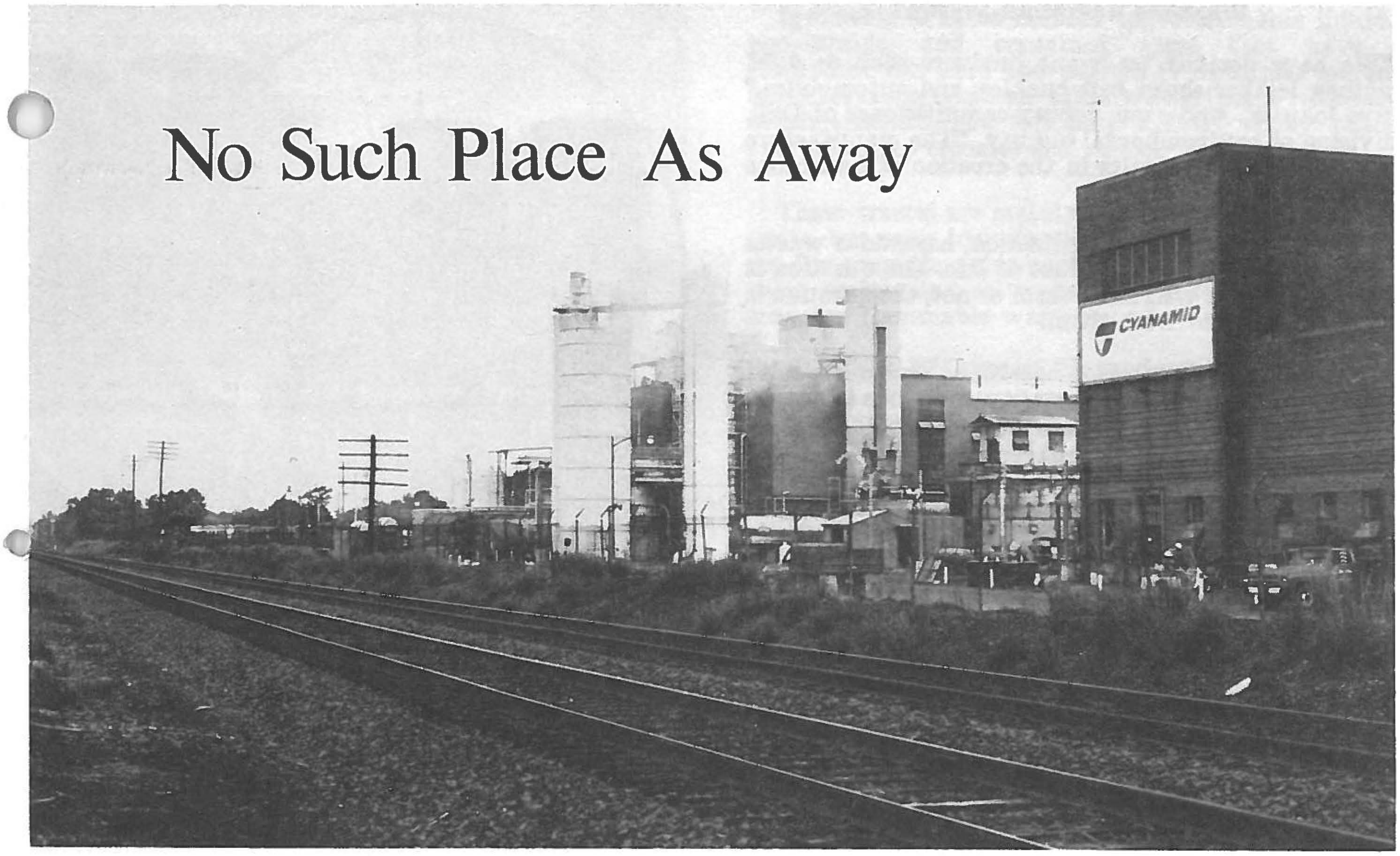
This month's main article is the first in a series of articles on DEP's hazardous materials management unit. It was not our intention here to overwhelm our readers with lots and lots of information. The reason for this lengthy treatment is that the subject of hazardous wastes and materials is a big one. While it is part of current environmental thinking that everything is connected to everything else, when you start scrutinizing the hazardous materials situation, the implications get very wide very quickly. In this series, maybe we can scratch the surface a little, clear up some misconceptions, and encourage you to find out more for yourself. As several of the people interviewed for this first article said, independently and unprompted, "We're all still learning."

We are happy to welcome a visitor and possible permanent resident to our state — the black bear. Also, we'll be taking you into the woods to show you some den trees and the creatures that inhabit them. Then we'll make a brief visit to New Haven's West Rock Nature Center, the one the kids built. And we'll talk about relocating nuisance wildlife, and why sometimes it doesn't work. And of course, our regular contributors are here again to keep you up to date on everything from conservation commissions to bottle gentian.

We hope you like this issue. We hope you'll stay with us as we find out more about our state, its natural beauty, and what we can do to keep it clean, safe, and healthy. And, of course, it is true — we all are still learning.

R.P.

No Such Place As Away



In modern, industrial civilization, hazardous wastes are a fact of life. They are the inevitable result of the manufacturing of articles we have decided we want. Pictured here, American Cyanamid in North Haven.

A Survey of Hazardous Waste Management in Connecticut

Text and photos
by
Robert Paier

When the toxic nightmare of Love Canal exploded into the headlines and the consciousness of the American people, the national response was immediate, impassioned, and fearful. What we were led to believe had been put safely out of sight and out of mind was suddenly, terrifyingly, right back with us, virulent, poisonous, murderous, in our schoolyards, in our drinking water, and quite possibly affecting our unborn children. The American people got scared, and rightfully so. Our way of life and our thinking would never be the same again.

Today, eight years later, tremendous progress has been made. New laws and regulations have been passed, and old ones have been given teeth. New technologies have been developed, and higher levels of professional expertise have been reached. Things have gotten visibly better and cleaner.

And, yet, today, the term hazardous waste continues to elicit fundamentally the same reactive response it did six years ago. There are indications that this kind of response, appropriate in 1978, is counter-productive in terms of effective action today. "It is as if," says Patrick Bowe, head of DEP's hazardous waste enforcement section, "people perceived some ugly, monstrous super-company which spews forth smoke and poison into the atmosphere, and pours chemicals into the streams and groundwater. The company produces no product, and performs no service to society. Its only function is the continuous creation of toxic wastes. That's not the way it is. In the real world, these companies produce the goods that give us our high standard of living."

In this article, we will take a look at the problem of hazardous wastes in Connecticut, assess the progress that has been made, and suggest how the future may be met.

What are Hazardous Wastes?

"We have decided we want products such as dyed clothes, leather shoes, belt buckles, and automobiles," says John W. Anderson, deputy commissioner of DEP, division of environmental quality. "The manufacture of these products results in the creation of hazardous wastes."

In modern industrial civilization, hazardous wastes are inevitable. They are a fact of life. The question is not whether we will have them or not; the question is what will we do with them.

According to Congress, a hazardous waste is a solid waste which may cause mortality or serious illness or may pose a hazard to human health or the environment when improperly managed.

For the purposes of regulations under the federal Resource Recovery and Conservation Act (RCRA) and in Connecticut, hazardous wastes are further classified according to the following characteristics:

Corrosive wastes are acids, caustics, or other mixtures which have a pH of less than or equal to two, or greater than or equal to 12.5. ("pH" is a scientific measuring scale ranging from one to 14. Strong acids are one, neutral is seven, and a strong caustic is 14.) Corrosives are also liquids that corrode steel at a rate greater than one fourth of an inch per year. Corrosive wastes include alkaline drain cleaners, acid liquids used in etching for computers, microchips, and battery acid.

E.P. (Extraction Procedure) toxic wastes include pesticides, pesticide residue, washing and rinsing solutions, and dips which contain concentrations of specific materials at or above the EPA toxicity level. The EPA extraction procedure exposes waste to mixing with a weak acid for a specified length of time, after which the waste is tested. The test gives the DEP an indication of how easily various components of the waste may move in the environment. Wastes which exceed regulatory limits are defined as hazardous.

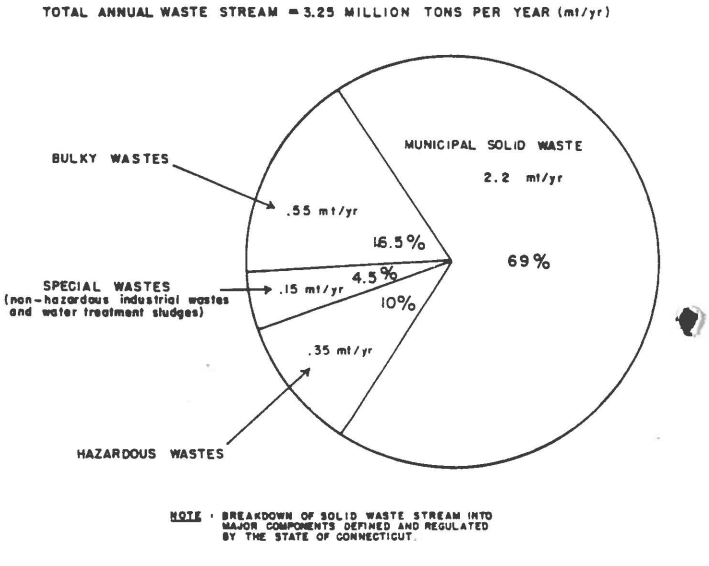
Toxic wastes, depending on chemical form and concentration, can produce injury upon contact or by accumulation. Examples are inorganic toxic metal salts, acids or bases, and compounds containing toxic metals, such as mercury. The largest quantities of toxic metal wastes are produced by the mining, metallurgy, electroplating, and metal-finishing industries. Synthetic organic wastes (materials containing primarily carbon), the stuff that surfaced at Love Canal, are often also toxic, and include waste products from halogenated hydrocarbons (e.g., spot removers), pesticides (e.g., endrin), polychlorinated byphenyls (PCBs), and phenols.

Some examples of toxic compounds are DDT, heptachlor, kepone, nicotine, strychnine, and 2,4,5-trichlorophenoxy.

Heavy metals and organics (also E.P. toxic wastes) are toxic at certain concentrations. They may include dusts, solutions, wastewater treatment sludges, paint wastes, and waste inks. Some examples are: lead from used solder, batteries, and paints; mercury from batteries; and silver from photographic film waste.

A hazardous waste is defined by Congress as a waste which may pose a hazard to human health or the environment when improperly managed.

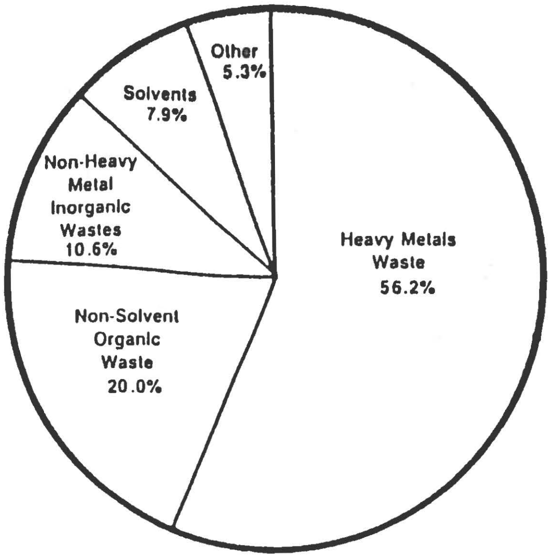
Reactive wastes are unstable, react violently or form explosive mixtures with water, or generate toxic gases or vapors when mixed with water. Other types are detonated by heat or shock, and some are readily explosive under normal pressures and temperatures. Examples include obsolete munitions, some manufacturing wastes from the exposives and chemical industries, cyanide wastes from electroplating, and contaminated industrial gases.



Source: 1983 Department of Environmental Protection estimates for Connecticut compiled by the Solid Waste Management Unit.

Figure 1. Connecticut's Solid Waste Stream — 1983

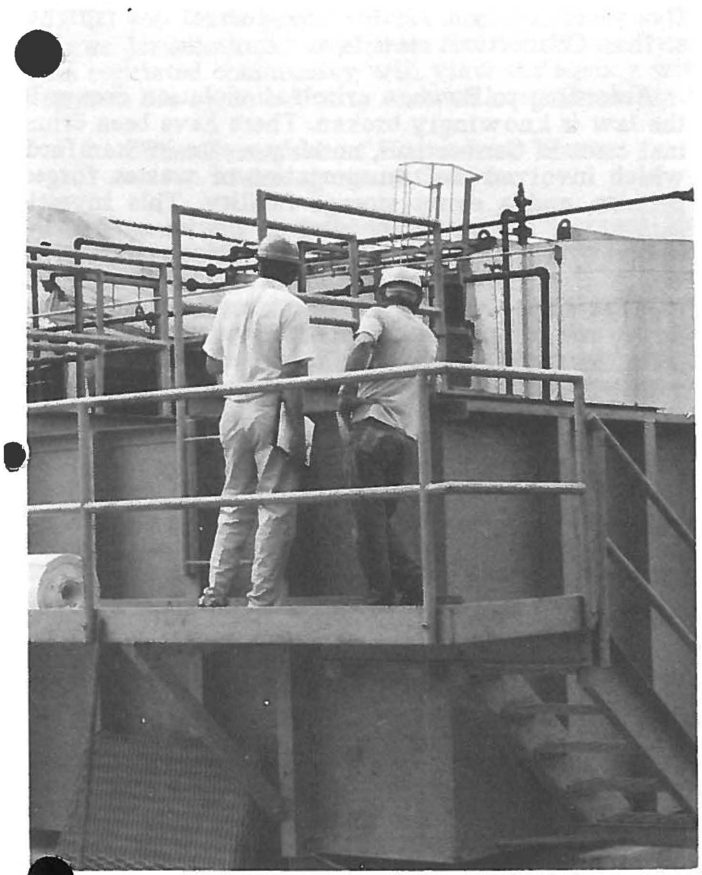
The annual waste stream in Connecticut in 1983; a total of three and a half million tons of hazardous waste is generated in our state each year.



Connecticut Hazardous Waste Management Service

Figure 2. Types of Hazardous Waste – 1983

Types of hazardous waste generated in Connecticut; the predominant waste type generated is heavy metal sludge, followed by non-solvent organic waste, and then solvent waste. There are no reliable figures for household hazardous wastes.



[illegible]P Field Inspector Peter Zack (left) makes sure all is in compliance at Humphrey Chemical in North Haven. Harley Tomlinson, the plant's environmental control manager, looks on.

Ignitable wastes include any flammable liquids, non-liquids, and contained gases that have a flashpoint less than 140 degrees F. Examples include spent solvents, ignitable paint wastes (paint removers, brush cleaners, and stripping agents), epoxy resins, and adhesives (epoxies and rubber cements).

These wastes are mainly contaminated organic solvents, but may include oils, pesticides, and plasticizers. For example, paint or varnish remover or stripper, paint wastes and solvents, such as toluene and benzene, are flammable wastes.

The Effects of Hazardous Wastes

It is important to understand that "hazardous" is a functional term. Wastes are considered hazardous when they are improperly managed. With proper management, there is little or no hazard. As Kathleen Golas, Chairwoman, Board of Directors of the Connecticut Hazardous Waste Management Service, indicated, anything can be hazardous: "If you drown in it, pure water is hazardous. The key to the problems of hazardous waste is control."

The greatest danger of hazardous wastes, and generally the hardest to remedy, is the contamination of surface and groundwater. This is especially true in Connecticut, where the groundwater is usually found very close to the surface. With such a delicate geologic situation, contamination occurs very easily. A contaminated aquifer will have far-reaching and long term effects, and the costs of remedying the problem, once it has become widespread, can be prohibitive. Individual wells and public water supplies also may become contaminated through this process.

Direct threats to human health may include skin rashes, breathing difficulty, dizziness, mental retardation, cancer, and genetic damage.

Other effects are the destruction of habitat for wildlife, contamination of soil for agriculture, destruction of marine life and livestock, and the contamination of sewers. Additionally, improperly managed hazardous wastes may cause fire and explosion.

The Options

There are fundamentally three options open in managing hazardous wastes: treatment, disposal, and recycling. Determining the appropriate option involves economics, the mortality factor of the substance in question, the degree of toxicity, and the regulations which pertain.

Treatment of a substance may mean neutralization, thus rendering it to a state which presents no danger. This may be accomplished biologically, by allowing the matter to biodegrade; chemically, as when an acid is neutralized by combination with a base; and physically, in volume reduction and solidification.

Another treatment option is incineration. At very high temperatures, synthetic organic chemicals can be completely, or almost completely, destroyed. The still untreated and untreatable hazardous ash residue will ultimately require secure landfill disposal, and perhaps some additonal treatment to chemically bind it prior to disposal.

Recycling, or resource recovery, is fundamentally a treatment method of mining hazardous wastes to extract usable material. The residue after this process will usually be less hazardous than the original material. Recycling and recovery, however, can never be 100 percent effective.

Finally, there is burial, or land-filling. Only certain wastes may be considered for this option, and there is a limited number of authorized landfills available. The trend of the future, according to Kathleen Golas, is away from landfill. Traditionally used for the disposal of most of the state's hazardous wastes, landfills will become less available in Connecticut.

The Picture in Connecticut

According to Stephen Hitchcock, Director of DEP's Hazardous Materials Management Unit, the state of Connecticut is very fortunate in that we do not have a big chemical industry here and, hence, our problems are within range of our present abilities.

In volume, our biggest problem is metal hydroxide sludge, a by-product of the metal plating, electronics, and metal manufacturing industries. Even in the early days of hazardous waste regulation, Connecticut required that all industrial waste discharges be pretreated. This treatment resulted in the formation of hydroxide sludges, which were filtered out of the discharge by use of lagoons or settling ponds. This gave Connecticut a tremendous jump on its neighbors in cleaning up its rivers and streams. The result of that, however, which was not realized at the time, was the potential contamination of groundwater. This remains a problem today, and its effect has yet to be finally realized.

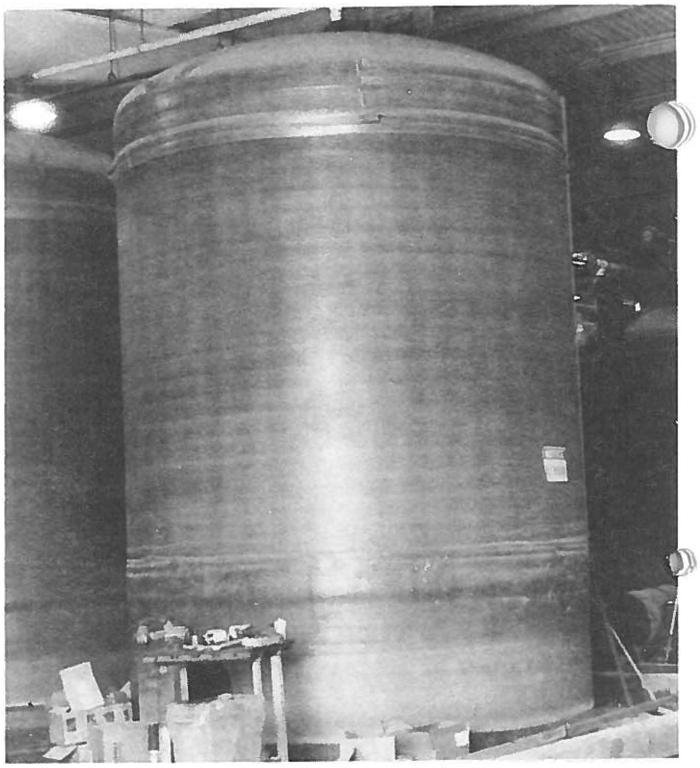
Another major problem, according to Hitchcock, is abandoned pesticides, generally occurring on farms and other agricultural property. This has caused contamination of wells in several towns in north central Connecticut.

The threat to groundwater by the uninformed small quantity generator is being addressed by new regulations. (For more on this, please see FYI in this issue.)

How the DEP Serves Connecticut

"Hazardous waste management has two main objectives," says Deputy Commissioner John Anderson. "First is to inventory and clean up abandoned sites, and second is to provide effective 'cradle to grave' management of hazardous waste."

The primary function of the unit, then, is to ensure that the laws and regulations in regard to hazardous waste management are complied with. The predominant reason for lack of compliance, says Patrick Bowe, enforcement section, is unfamiliarity with regulations. This is usually remedied by the inspectors when they visit a generator. When someone is out of compliance, there are a number of steps taken: warning letters, notices of violation, administrative orders, and cease and desist orders. Finally, civil and criminal action may be taken. Civil penalties may go as high as $25,000 per day per violation, says Bowe, and criminal penalties may go as high as a million dollars and five years in prison. At this time, federal law is tighter than Connecticut state law.



This large fiberglass tank is part of the Envirite hazardous waste treatment facility in Thomaston. Connecticut has four such commercial treatment plants.

According to Bowe, a criminal violation occurs if the law is knowingly broken. There have been criminal cases in Connecticut, notably a case in Stamford, which involved the transportation of wastes, forged permits, and a secret storage facility. This investigation, the largest of its kind in the state, was initiated by a letter of inquiry from a New Jersey firm which was considering doing business with the Connecticut facility. Most Connecticut companies, says Bowe, are concerned about doing the right thing. Some, however, are willing to cut corners at the expense of the environment and public health and safety.

The groundwater monitoring section is headed by principal environmental analyst Michael Powers. Its function is to supervise the monitoring of groundwater at land disposal facilities, and to determine the existence of any impact, actual or potential, on groundwater. The thrust of this program is preventative, says Powers, but in the event of contamination, it will recommend mitigating steps. These steps may be required by an administrative order of the commissioner of the DEP.

The function of the permits section, according to principal environmental analyst Barry Giroux, is to issue permits to each storage or disposal facility of hazardous waste in the state. "The permit process has evolved to a point where it is clearer and more specific," says Giroux. "Now we know what we wa[illegible]." This section is also involved in closure plans, of tremendous importance in terms of determining ultimate financial responsibility.

Field Inspectors Peter Zack and Douglas Zimmerman respond to a complaint of abandoned materials in Waterford. The materials involved turned out to be non-hazardous. The DEP depends greatly on citizen complaints.

"If you have good policies, applied consistently, across jurisdictions," concludes Patrick Bowe, "then the regulated community will view the agency with respect. We operate firmly and with predictability."

The Connecticut Hazardous Waste Management Service

The Connecticut Hazardous Waste Management Service is a quasi-public corporation, mandated by the Connecticut legislature to ascertain the kinds and amount of hazardous waste generated in the state, to study current management methods, and to develop a statewide plan for safe and effective management. This involves recommendations for on-site treatment, the siting of plants, and interstate cooperation. Kathleen Golas is the chairwoman and chief executive officer of the Service.

"The problems facing us are complex," says Golas, "and we cannot expect to find one simple solution. The starting point is education."

In 1983, Connecticut generated 200,000 tons of hazardous waste. Seventy-eight percent of that was treated in state, either on-site or at local treatment facilities. (Furthermore, Golas pointed out, the state has the capability of treating as much as 88 percent, but industries may choose to use facilities outside the state.) The remaining 22 percent, in 1983, was shipped out of state, either for further treatment or to landfills in two locations in New York State and one in Canada.

While Connecticut does not have the capability to manage all the hazardous wastes generated here, work is being done to expand options and to ensure that all waste is properly managed, whether in state or out, Golas says. It may not be possible to be totally self-sufficient on the state level. Waste management must be addressed as an interstate issue, which involves coordination and cooperation.

"Our approach to solving environmental problems in the future," says Golas, "must be more comprehensive. We cannot continue to solve our air problems by creating water pollution problems. We must understand that there is no such place as away. By virtue of our present society, we will continue to incur some environmental damage. Our task is to do what we can, to minimize the damage the best that we can."

Regulation and Connecticut's Industries

While it is clear that strong regulation of industry is in the best interest of the environment and public health, it may be surprising to find that these regulations are consistent with, and perhaps even identical to, good management practices. "An industry that has a strong regulatory compliance program," says Robert Klancko, manager of environmental special projects at United Illuminating, "is a well run and cost effective company." Good management means using all resources economically, minimizing by-products and product loss, and planning for future contingencies. This is also sound environmental thinking.

"Unfortunately," says Klancko, "many generators take a reactive, piecemeal approach to regulations. What they should do is reanalyze their total facility to undertand how the total scope of the regulatory programs can be used to maximize the cost effectiveness of compliance." Klancko feels that hazardous waste regulations are one piece of a total conceptualized scheme, including state and federal environmental agencies. Contradictions do exist, he says, but these can be approached with a spirit of optimism and intelligence. "It is OK to disagree with the inspector," says Klancko. "If this is approached as a positive dialogue, it can be a learning experience for everyone involved."

According to Patrick Bowe, in instances where a regulatory contradiction occurs, the DEP is willing to evaluate and clarify the situation. "Regulations may be modified," says Bowe, "to allow uniform common-sense compliance with the intent of the laws."

Household Hazardous Wastes

Household hazardous wastes are certain chemicals found in products in common use in the home. "They present the same potential danger to the environment," says John Anderson, "as their industrial counterparts if they are disposed of improperly."

Household hazardous wastes are possible fire hazards, a danger to children and pets, and the source of toxic air-pollutants that contaminate indoor air.

Such wastes have begun to be collected on a one-time basis, with the individual municipalities being financially assisted by the state. The town of Ridgefield was the first in the state to hold a hazardous waste collection day. The benefits of the collection day are manifold; not only is hazardous waste disposed of safely, but education and public participation are encouraged.

Connecticut's Treatment Plants

One of the misconceptions about our state, according to Kathleen Golas, is that we have no commercial treatment plants here. In fact, there are four. Of those four, "Envirite" is able to landfill because its end-product, a metal hydroxide sludge, has been "delisted" by the EPA, which means it is not hazardous. Two of the facilities must landfill out of the state, because their treatment residues are still considered hazardous. The third facility reclaims solvent materials. The residue from reclamation is shipped out of state for incineration.

There are many obstacles in building waste treatment plants. These plants are much desired, however, by Connecticut industry, which compared to other states, says Golas, has been operating at a disadvantage for years because of our very stringent treatment regulations. The costs involved in treating hazardous wastes are not small, and will continue to increase. Transportation can be as much as 50 percent of disposal costs. Therefore, all things being equal, the closer plants are to the generator, the better for Connecticut industry.

Not in My Backyard

"People seem to believe," says Patrick Bowe, "that somewhere, over the next hill, maybe in the next town, beyond the next valley, there is somebody who will be willing to take this waste."

As Kathleen Golas remarked, "There is no such place as away."

A response frequently encountered by those proposing the construction of a hazardous waste facility is the NIMBY response — "not in my backyard." It reflects, according to Bowe, an emotional rather than rational view. The possibility of a hazardous waste facility in your town, in your neighborhood, can be frightening.

However, it is important to understand here that tremendous progress has been made, new techology has been in force, and that laws and their enforcement have been vastly increased and strengthened. The situation today is not the same as it was in 1980.

What many professionals seem to be saying in response to "not in my backyard," is that everywhere is somebody's backyard, and that only by acting cooperatively and with a willingness to compromise will we achieve a clean and healthy environment.

Looking Ahead

"In 1973," said Stephen Hitchcock, "I remember looking at the Naugatuck River, and thinking to myself, 'If they can clean up that, they can clean up anything.' Today there are fish in that river."

An evaluation of the progress made in dealing with hazardous waste gives cause for optimism. We have made tremendous strides in coming to terms with this challenge. The work, however, is far from over.

A major problem before us is to go beyond the "Love Canal mentality," so that industry, government, and the citizens of the state can work together rather than at cross-purposes. This will require effort in terms of education and willingness to learn from all involved, as well as the understanding we all will indeed have to make sacrifices.

The landfill option is simply going to be harder to come by. Legislation is going to require that hazardous materials be treated and neutralized, which will mean that, yes, new treatment facilities will have to be built, and yes, costs are going to get higher for the safeguards required, even though costs have risen over 10 times in the last five years. Hazardous waste management is going to get even more expensive.

Further expenses will result from the fact that smaller quantities of hazardous waste are being found to be dangerous. This requires more sensitive technology, and more complete treatment processes.

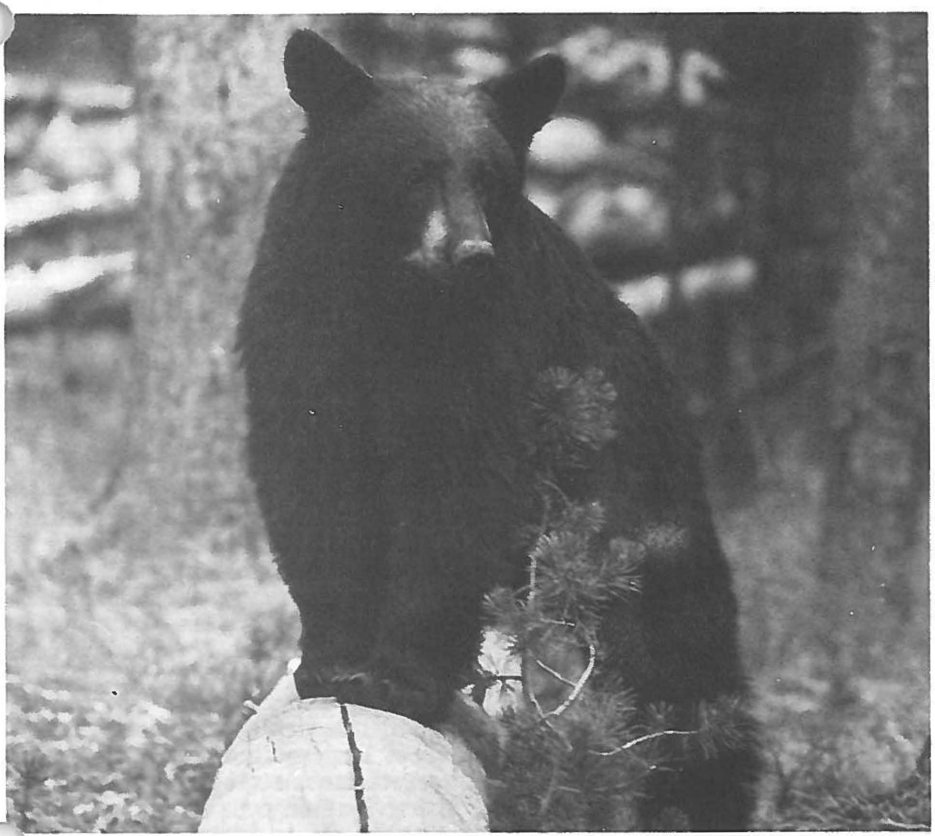
On the other hand, according to Patrick Bowe, the capability to address the problem of hazardous waste in an environmentally sound fashion does exist. "Among the things we can do to make the job easier," says Bowe, "is to produce no more waste than necessary. With careful monitoring, we can get less waste, and more product. Also, we can select industrial ingredients in a more sound manner. With more intelligent choices of ingredients, less toxic material is generated."

"We now know," says Stephen Hitchcock, "that the world doesn't have to be filled with smoke and sludge and junk." It doesn't have to be. And, with [illegible] balanced and intelligent approach, with a spirit of cooperation and the understanding that, in fact, there is no such place as away, then maybe it won't. ■

This is the first of a series of articles on the management of hazardous waste and hazardous materials in Connecticut.

Field Inspector Zack examines leaking drums. The field inspectors work at the critical point where regulations and those regulated meet. The job requires expertise and diplomacy.

DEP Wildlife Information Series



Once limited to the untamed wilderness, the black bear may now be seen in certain parts of Connecticut. (Photos by Leonard Lee Rue III.)

Black bear cubs usually remain close to the mother for the first year.

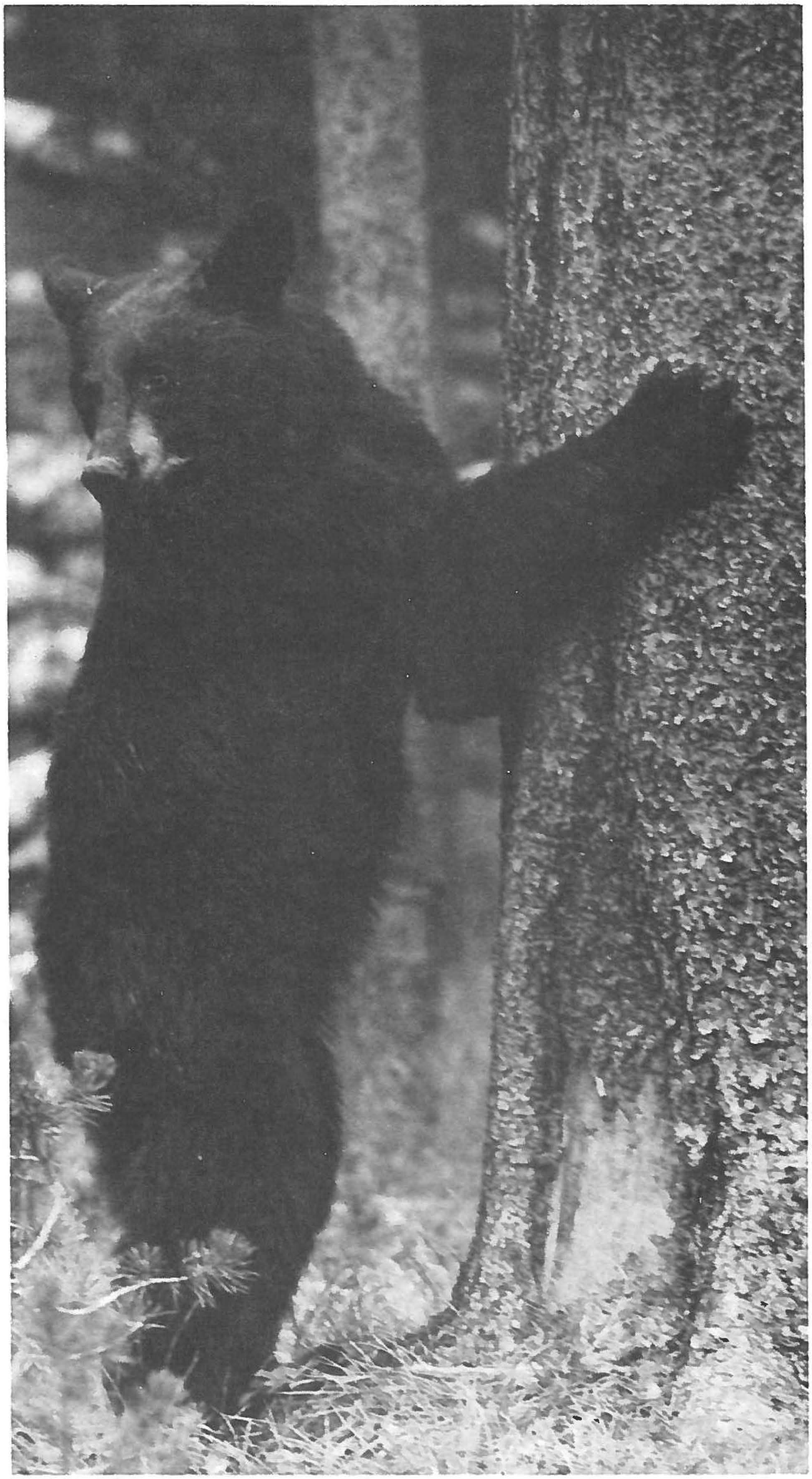
And now, in Connecticut, the black bear

Black bears (*Ursus americanus*) are the smallest of the North American bears. Their pelage color varies from black in the East to black and brown phases in the West. The sexes are similar in appearance, although males are usually larger. Adults are five to six feet long, and weigh from 100 to over 400 pounds, while yearlings weigh about 60 pounds. Black bear skulls have 42 teeth.

Historically, black bears were more numerous throughout most of their range. Extensive land clearing for agriculture and persecution extirpated the species from much of its eastern range (including Connecticut by 1840). Today many black bears range across New England and throughout most of the United States and Canada. Their current population level seems to be directly related to the amount of suitable habitat available. Local declines in bear numbers are occurring in some areas, while habitat improvement is causing local increases in others. Our neighboring states, Massachusetts and New York, are experiencing slight upswings in black bear populations. As a result, Connecticut sightings are on the rise. Litchfield County (specifically the northwestern area) is where black bears are typically sighted in our state.

Biology

Home ranges covering 50 to 75 square miles are not unusual for black bears. They lead a nomadic existence within this range, and are usually nocturnal, traveling and feeding primarily at night. Being omnivorous, black bears forage on a wide variety of plants and animals.



The bear populations of Massachusetts and New York are experiencing slight upswings, which accounts for increased sightings in Connecticut.

Typical foods include grasses, woo[illegible] fiber, berries, nuts, tubers, insects, small mammals, eggs, garbage, and carrion (decaying animal matter). Though it takes a large volume of food to make a meal, these creatures rarely starve. Reproductive failures, however, occur following years with poor mast crops (hard fruits and nuts).

Prime black bear habitat is characterized by inaccessible terrain, thick understory vegetation, and abundant food resources. Mixed hardwood forests interspersed with streams and swamps are typical habitat. Den sites are usually hollow logs, windfalls, brush piles, or caves; these sites are used by bears during periods of semi-hibernation. Over the span of winter dormancy, a bear's metabolism may drop 50-60 percent; a weight loss of 20-27 percent is common. Throughout the entire winter denning period, the bear does not eat, drink, urinate, or defecate. Since these large mammals are primarily vegetarians, ecologists suggest this behavior may have evolved as a mechanism to carry them throu[illegible] the time of year when fo[illegible] shortages are greatest.

Black bears become sexually mature at approximately three and a half years of age, but some females may not breed until their fourth year, or later. Breeding occurs during the summer months, usually in late June or early July. Males then travel extensively in search of receptive females; bears do not form long-term pair bonds, so both sexes typically have more than one mate during the breeding season. Fighting may occur between rival males, as well as between males and unreceptive females. Dominant females may suppress the breeding activities of subordinate females. Delayed implantation occurs after mating, so the embryo does not implant until the winter dormancy period. Young are born in the den during January or February. Litters usually contain two or three cubs, each weighing seven to 12 ounces at birth.

After giving birth, the sow may continue her winter sleep while the cubs are awake and nursing. La[illegible]tating females do not come into [illegible]trus, so females generally breed only every other year. Parental care is solely the female bear's responsibilty. Males may kill and eat cubs if given the opportunity. Cubs are weaned in late summer, but usually remain close to the female throughout most of their first year, and den with her during their second winter. This social unit breaks up prior to the female's next estrus. These displaced yearlings may travel great distances in search of their own territory.

Economic and Social Values

In Connecticut, the black bear has been offered total protection since 1973, and cannot be hunted or trapped. However, opportunistic bears often come into conflict with humans by feeding upon crops (corn, apples), beehives, or garbage. Bears are harvested in other states under these circumstances to maintain populations at desirable levels and to collect biological information. Because of their strong homing tendency, bears are trapped and relocated with little success, unless they are moved more than 50 or 100 miles from the capture site. Black bear meat is considered quite latable.

Though typically shy and secretive, the black bear is a formidable animal, a symbol of immense power and sagacity, and is one of our last great predators. Once limited to areas of untamed wilderness, some bears now make adjustments for increased development and other habitat changes within their home range. Connecticut has suitable habitat to sustain a limited year-round population. As the bear population increases in Connecticut, human/bear interactions will no doubt increase. These situations will be best resolved by making unnatural foods unavailable to bears and by educating the public about them. Only time will tell whether the black bear is compatible with our densely-populated state and will become a more permanent resident in Connecticut.

The Technical Assistance Informational Series is 75 percent funded by the Federal Aid to Wildlife Restoration — the Pittman-Robertson (P-R) Program. The P-R Program privides funding through an excise x on the sale of sporting firearms, mmunition, and archery equipment. The remaining 25 percent of the funding is matched by the Connecticut Wildlife Bureau. ■

An adult black bear may be six feet long and weigh more than 600 pounds.

Litters usually contain two or three cubs, with parental care the sole responsibility of the female.

Cavity trees such as this one are often sites for raising mammalian young.

When a Tree Dies

Text and Photos
by
Nancy Kriz

The death, decay, and eventual disintegration of a tree is a natural process which provides benefits to other living things. While it was once thought that dead or dying trees should immediately be removed from a forest because they harbored insect pests and diseases, research has, in some cases, indicated this may not be true. In fact, we know that bird and animal species which inhabit such trees feed on insect pests. For example, black-capped chickadees, voles, and white-footed mice feed on the gypsy moth in either its larval or pupal stages.

Richard DeGraaf and Alex Shigo, in their monograph "Managing Cavity Trees for Wildlife in the Northeast," state the following: "Dead trees and trees that contain decayed wood provide shelter for approximately one fourth of the forest wildlife species in the Northeast. Both birds and mammals use cavities in such trees for shelter from the weather, to escape from predators, for foraging and caching food, and most importantly for producing and rearing young."

When a live tree is injured by lighting, insect infestation, high winds, or ice storms, it begins to seal off the injured area from the healthy, live tissues. A barrier is created and decay, promoted by fungi and bacteria, commences. Water, insects, and parasitic nematodes join in the decaying processes within the compartmentalized area. A cavity results. (This only occurs if the wound remains open to outside influences. If the wound is healed over, decay continues but no cavity results.)

The Process of Decay

Trees acting as sites for raising mammalian young are called den trees. The size of the cavity dictates the type of mammal or bird which may use it. DeGraaf and Shigo studied cavities and discovered that, due to compartmentalization, the cavity will be no longer than the diameter of the tree when the wounding occurred. If the tree was injured when it was six inches in diameter, the hollow formed by the sealing-off process will be no more than six inches wide, but may be less.

Mammals which use den trees (or logs) include opossums, porcupines, foxes, raccoons, weasels, bears, bat species, and several squirrel species. Cav[illegible]ty-nesting birds include bluebirds, nuthatches, wre[illegible] purple martin, tree swallows, chickadees, tufted titmice, owls, wood ducks and mergansers, and all woodpecker species.

The value of a tree to wildlife does not end with its death

When a tree dies, it progresses through distinct and identifiable stages of decay. Each stage benefits specific species, not only of mammals and birds, but of insects, amphibians, reptiles, and other tree and plant life. During the first stage following death, the branches become perches for vultures, hawks, eagles, kestrels, herons, egrets, and ospreys.

The next step in the breakdown process is that the tree bark commences to slough off. Bat species will roost under loosened bark, brown creepers will nest under the bark.

The Snag Stage

The tree is finally stripped of all bark. At this point, it is referred to as a "snag." It is during the snag phase that woodpecker species (hairy, downy, pileated, and northern flickers) will most often excavate cavities in the decayed wood of dead trees. (Woodpeckers will, however, do the same in live trees.) A vacated cavity may then be used by secondary cavity nesters like chickadees and bluebirds.

Snags slowly disintegrate. Their tops break off. Fallen logs may become dens for foxes, skunks, minks, bears, or chipmunks. Ruffed grouse may use them as drumming logs. Woodcock and quail may utilize them for shelter.

The Stub Stage

When a snag is reduced to a height of 20 feet, it is called a "stub." In time, a stub completely rots and falls. Carpenter ants move in, providing a favored food for pileated woodpeckers. Skunks will forage around the base of a stub for grubs. Beetles and insect larvae in decaying wood act as food sources for shrews, moles, ground squirrels, and foxes. Salamanders will live in the rotted wood.

Microorganisms, bacteria, and fungi which live in the soil further break down the decaying wood. The end result of this decomposition is humus. Humus is organic matter which increases the water retention capacity of the soil and helps soil to resist erosion.

Obviously, a large, strong healthy tree with numerous potential cavity-forming areas is best for wildlife. When the tree dies, the decay stages will be longer and therefore provide an extended period of benefit to wildlife. DeGraaf and Shigo list the trees with the highest cavity values based on longevity and ability to compartmentalize as follows: eastern hemlock, red and black oak, sugar maple, American beech, and white ash.

Wildlife of the Future

It is critical that the preservation of den trees, cavity trees, snags, and stubs become a conscious part of forestland management practices in order to ensure their presence for future wildlife generations. If you would like assistance in managing your woodland for wildlife, contact Dr. John Barclay, Cooperative Extension Service, College of Agriculture, Box U-87, University of Connecticut, Storrs 06268, or DEP Bureau of Forestry, 165 Capitol Avenue, Rm. 260, Hartford 06106.

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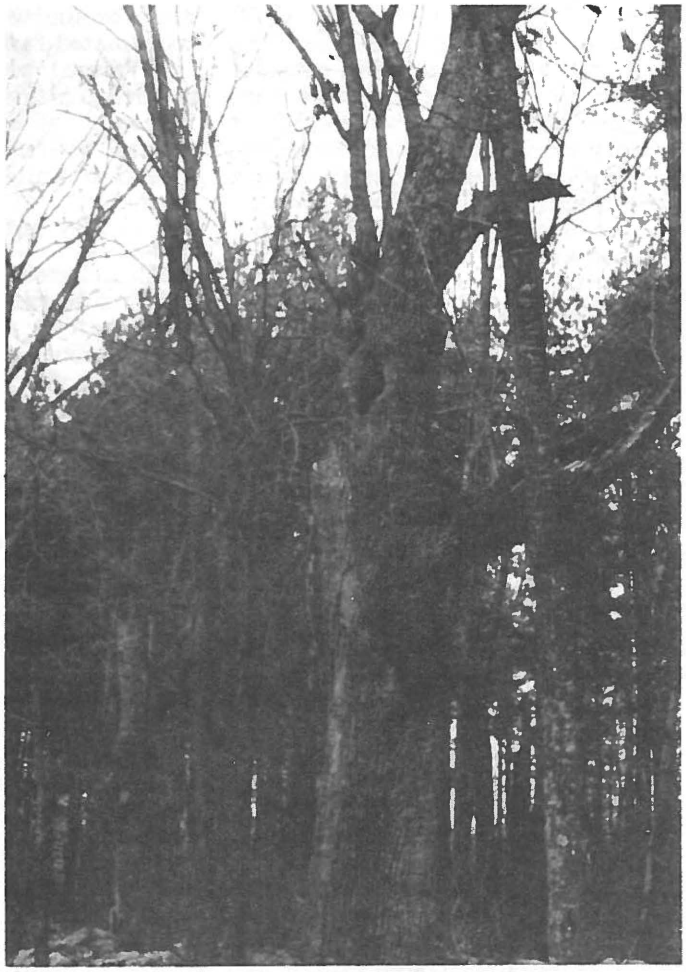
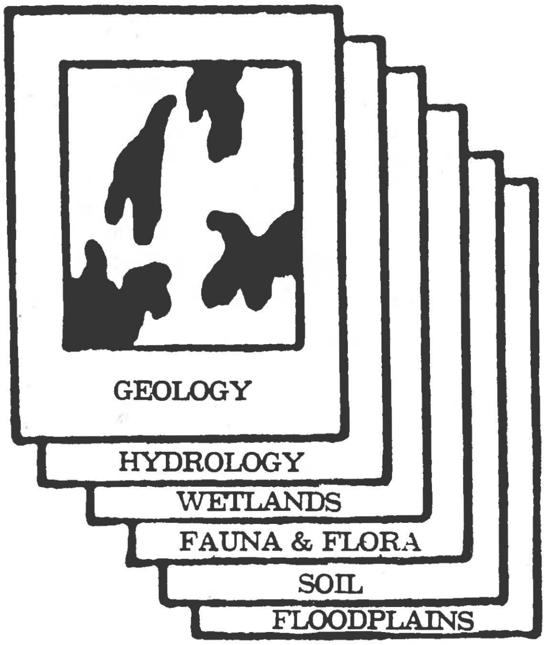


The preservation of certain dead trees is an important part of forestland management.

The Critical Role of Your Town's Conservation Commission

by
Jim Murphy
Principal Environmental Analyst
Water Compliance Unit



Public Act 85-279 modified Sections 8-2 and 8-23 of the General Statutes. This Act compels planning and zoning commissions to consider protection of present and future sources of drinking water. Water supply protection should, however, be considered a basic responsibility of all local boards and commissions, as the end result will be an enhanced quality of life for all town residents. This is the principal responsibility of all local officials.

To meet these new statutory mandates, planning and zoning commissions will need the support and technical assistance of other local commissions. This article will focus on the role of conservation commissions in supporting local planning and zoning commissions.

Section 7-131a of the General Statutes details the mandatory and discretionary functions of a conservation commission. Basically, the commission's duties involve research and inventory of natural features, recommendations for their usage to the planning commission, and regulation of lands acquired for conservation purposes. Beyond these activities, commissions may also provide technical assistance in conservation practices, conduct information and education programs on natural resource conservation, and advise other boards and commissions on open space opportunities.

The DEP recommends towns address groundwater protection in a coordinated fashion through the use of a staged planning process. One segment of this process calls for an inventory of a town's cultural and natural characteristics. The conservation commission can ensure the availability of an updated natural resource inventory.

This inventory should include location of geologic features, such as bedrock types and characteristics, and surficial geologic information, such as soil types and location of drift deposits. Local hydrologic system components, such as drainage basin boundaries and the surface and groundwater features within these basins, should be identified. Species of fauna and flora within a town, especially those which are rare or unique, should be located.

This data is a direct indication of a town's quality of life, and is important in future land and water use decisions.

A conservation commission represents a town's major source of expertise in natural history and resource conservation practices. Members can serve as educators for all age groups. When other boards, commissions, or the public require assistance, an informed conservation commission, supported by an up-to-date information base, can be of significant aid.

For example, if local needs for open space are inadequate, a commission can assist in identifying areas suitable for education trails, picnic sites, fishing or hunting areas, nature study. Armed with a comprehensive inventory, a commission can identify and prioritize resource conservation needs and recommend management methods.

The DEP has identified open space uses as those which pose the least risk to groundwater quality. As present and future needs and sites for water supply are identified, the commission can assist in acquiring these areas. If municipal ownership is not feasible, measures to acquire conservation easements will have to be explored. In that endeavor, a conservation commission can identify appropriate open space designation measures.

The DEP is preparing a summary of open space acquisition alternatives and is developing a program which will provide the data communities may require for their conservation programs. As these initiatives are completed, they will be summarized in the *Citizens' Bulletin*.

The DEP encourages broad involvement in planning for groundwater protection, and we see statewide, regional, and local conservation groups as playing central roles. ■

New Small Quantity Generator Regulations

by
Elizabeth Flores
Senior Environmental Analyst
Hazardous Waste Management Unit

Thousands of small businesses in Connecticut generate hazardous waste during the course of normal operations. These businesses cover a wide variety of manufacturing operations: metal finishers, auto body shops, vehicle maintenance, furniture refinishers, dry cleaners, printers, laboratories, etc. Even small amounts of these wastes can cause serious problems if improperly managed.

In order to ensure that hazardous wastes are properly managed and to protect human health, safety, and the environment, hazardous waste regulations were promulgated, and went into effect in Connecticut in 1980. These regulations were mainly aimed at large generators, transporters, and treatment, storage, or disposal facilities. Even then, however, small quantity generators of hazardous wastes (SQGs) were subject to some regulations.

As of September 22, 1986, these SQGs are going to be subject to even stricter regulations. In order to understand how they will be regulated, they will first have to determine what category they fall into — whether they are generators, small quantity generators, conditionally exempt small quantity generators, or non-handlers.

Generators handle over 1000 kg hazardous waste per month (total of all waste streams), or accumulate more than that amount on-site at any one time.

SMALL QUANTITY GENERATORS
26 - 260 GALLONS
220 - 2,200 lbs.
100 - 1,000 kg.
SQG
BE A PART OF THE POLLUTION SOLUTION

Small Quantity Generators handle less than that amount. Those who generate between 100 and 1000 kg per month (or who accumulate that amount on-site) are the focus of the new regulations.

"Conditionally Exempt" Small Quantity Generators handle less than 100 kg per month on-site, and are subject to fewer requirements, as long as they comply with certain standards.

Non-handlers don't generate any quantities of hazardous waste.

If you're not into metrics, 100 kilograms is the equivalent of 220 pounds, or (based on the weight of water) 26 gallons (about one half of a 55-gallon drum). If a company falls into the 100-1000 kg category, as of September 22, 1986, it will basically have to comply with the requirements listed below. (Please refer to the actual regulations for details and exceptions.)

Small quantity generators handling between 100 and 1000 kg of hazardous waste must now:

●☐ Determine which of their wastes are hazardous.

File a notification form with DEP and obtain an EPA ID number.

Store waste for no longer than 180 days.

Use a hazardous waste manifest to ship waste off-site.

●☐ Use a permitted transporter to haul the waste (or qualify to transport their own waste).

●☐ Send waste to a permitted facility for treatment, storage, or disposal.

Prepare and implement a rudimentary emergency response and personnel training program.

● File an annual report on hazardous waste generated with the DEP.

●☐ Properly manage their waste so that it does not present a threat to the environment or public health and safety.

(● means existing requirement in effect since 1981 for all SQGs handling less than 1000 kg; ☐ means requirement applies to SQGs handling less than 100 kg under existing Connecticut regulations.)

Under a federal grant, the DEP has developed informational material to help SQGs understand the new regulations. We also supply notification packages (application for an EPA ID number) and manifests (hazardous waste shipping papers). If you are an SQG and would like to know more about hazardous waste regulations, write or call: DEP, Hazardous Waste Management Section, 122 Washington Street, Hartford 06106 — (203) 566-8843/8844.

What if you know a company is not properly handling hazardous waste? Maybe you are an employee, and have seen hazardous wastes dumped on the ground, or down the drain, or into a dumpster. Or you know that the company you work for is not using a permitted hauler. Or you are a neighbor, and you can see drums leaking chemicals onto the ground. What can you do? The Hazardous Waste Management Section has a limited number of inspectors, and we rely greatly on citizen complaints. Call the DEP Hazardous Waste Management Section (566-8843/8844/5019) with the facts, and we will follow up. Action will be taken against owners whose sites do not comply with the hazardous waste regulations, or which present a threat to public health or the environment. ■

Restoring Coastal Embayments

by
Diane Giampa
Principal Environmental Analyst
Planning/Coastal Area Management

Connecticut's coastal coves and embayments — those partially-enclosed bodies of water connected to tidal rivers or Long Island Sound — have long offered Connecticut's citizens sheltered and scenic spots for fishing, swimming, boating, or just relaxing. These embayments are also important ecologically because their salt marshes and tidal flats are the home of many plants and animals that form important links in the marine food chain.

In the coming months, a new statewide embayment restoration program will be put in place, administered by the DEP's Office of Planning and Coordination/Coastal Management. The cost-sharing program should provide a systematic and fair approach toward solving environmental problems in the state's degraded embayments.

As the Connecticut shoreline has been developed over the years, many coastal embayments have been damaged in the process. Embayments need to be cleansed by a daily influx of water brought in by the tides, but in many cases this crucial flushing has been restricted or tainted by pollutants.

We are now seeing the effects of development at various trouble spots along the shore. Shellfish beds have been closed, healthy plant and animal life in tidal wetlands is being lost, uncharacteristic odors at low tide have been reported, and swimming and boating conditions have deteriorated.

During the June, 1983, session of the Connecticut General Assembly, the Legislature passed Public Act 83-13, "An Act Providing for a Program to Protect the Coast." The bill called upon the commissioner of the DEP to appoint a coastal coves and embayments advisory board to study degraded coastal waterbodies, to make recommendations for solutions on a coastwide basis, and to initiate a pilot restoration project to test the broad applicability of the board's recommendations.

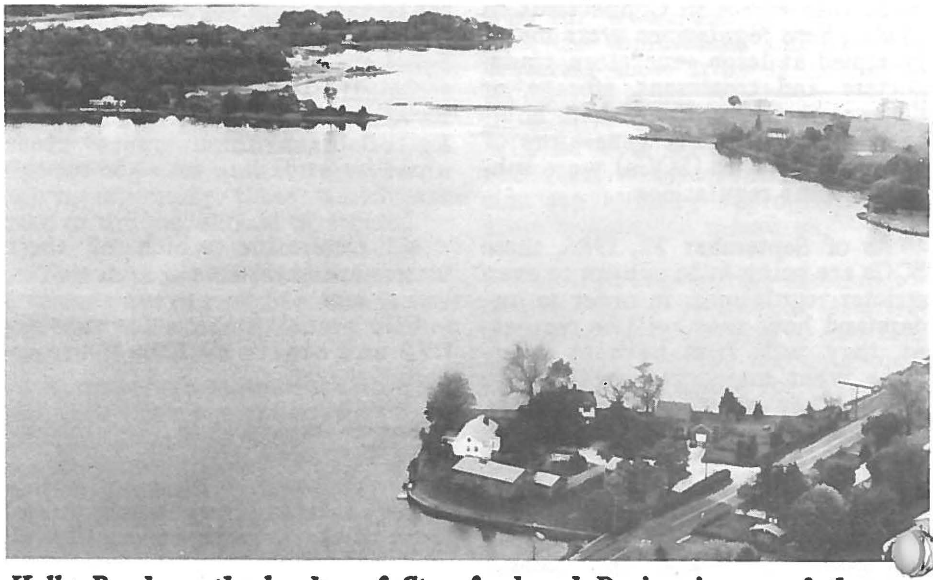
After two years of analysis, including the evaluation of environmental data provided by a DEP-sponsored study of the state's embayments, the board selected three pilot projects: Ash Creek, on the border of Bridgeport and Fairfield; Holly Pond, on the town line between Stamford and Darien; and Alewife Cove, bordering Waterford and New London.

The local response to the pilot projects demonstrated to the embayment advisory board that the best and most consistent way to address the problems in coastal embayments was to design a management program based on a state and local partnership: the state would provide the financial incentive, or "seed money," necessary to encourage the coastal towns to assume the balance of the funding and the management of practical, tangible improvement projects in specific coves.

As a result, the board proposed, and the Legislature has recently approved, a bill to establish a statewide cove restoration program with a bonding authorization of $200,000. Public Act 86-382, "An Act Concerning the Protection of Estuarine Embayment," is designed to address the problems of water quality, siltation, and erosion in coastal coves and embayments. As the new program gets under way in the coming months, municipalities will be invited to put forward embayment restoration projects for consideration for state funding on a cost-sharing basis. DEP's Commissioner Stanley J. Pac will then evaluate the eligibility of each proposed project.

To help the commissioner in his evaluations, the advisory board recommended several threshold criteria. In order to be eligible for funding under the program, a proposed project must be consistent with the policies and standards in Connecticut's Coastal Management Act. The town must also demonstrate that local funding is available to support at least 50 percent of the estimated cost of the project, and the municipality must be willing to develop a monitoring program to determine the long-term environmental impacts of the restoration activity And, since taxpayers' dollars wi be used, the board stipulated that candidate embayments must be accessible to the general public.

Restoring our coastal coves and embayments benefits everyone in Connecticut — those of us who live in the shoreline towns as well as those of us farther inland who enjoy being at the shore. ■

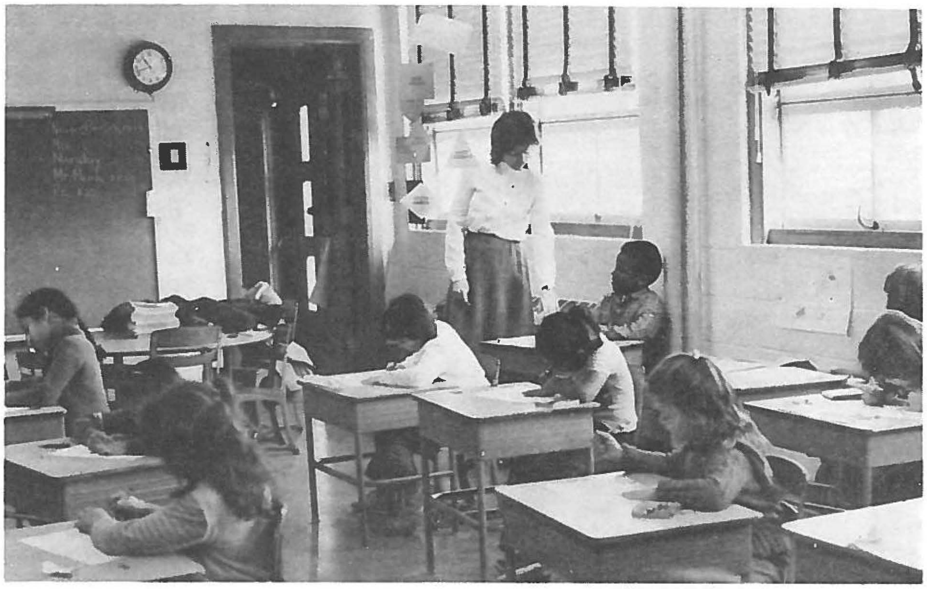


Holly Pond, on the border of Stamford and Darien, is one of the cove restoration pilot projects. (Photo courtesy of Stamford's Environmental Protection Board.)

Toward the Classroom

Environmental Education News

by
Martina Delaney
Environmental Education Coordinator



DEP programs integrate environmental education into a school's existing curriculum.

The education staff of the DEP is available to help Connecticut teachers introduce environmental concepts and issues into the classroom. For the past eight years, the DEP has been involved in a state-wide environmental education program. Among other things, it has provided environmental education materials and techniques to teachers through a series of in-service workshops. This program is unique in its use of a curriculum matrix, which allows the DEP staff to integrate environmental activities into a school's existing curriculum.

As part of this program, a cooperative effort with the Meriden public school system is now taking place to develop a water education program. This program was piloted in Meriden's schools during the spring of 1986, with anticipated state-wide dissemination of the program during the 1986/87 school year.

The process has entailed three steps: 1) an initial introductory meeting with school administrators; 2) the formation of a teacher committee and the review of current curriculum objectives for grades K-12; and 3) the curriculum supplement, which involves activities and support materials to be used in the classrooms. This supplement is really the key to the program, since it links water activities to Meriden's existing curriculum objectives, as well as to seven water education components established by DEP.

Other steps include teacher workshops or meetings with teachers conducted by DEP education staff. Here, specific activities will be conducted and additional ideas and support materials will be presented. And, beyond that, DEP staff will conduct some direct service classes with students. This follow-up will be a reinforcement to teachers, allowing them an opportunity to see some of these activities conducted with their own students. To date, several classes have already been conducted on the eighth grade level.

It is hoped that through a coordinated and well-planned program, students across the state will be exposed to environment-related themes, such as the water education program in Meriden. For more information, please contact the DEP education staff at 566-8108. ■

Soil Conservation Cartoon Booklet

The Soil Conservation Society of America has released a new educational cartoon booklet and teacher's guide. It is designed to help young people understand how environmental management decisions are made and what individuals, small groups, and governments can do to influence our quality of life.

The story describes three children who stumble into a cave filled with robots and the world's smartest computer, whose purpose is to restore the quality of life on earth after a worldwide disaster. Questioning the robots, the children learn that difficult decisions will have to be made.

The teacher's guide accompanying the booklet includes background information, four activity masters, plus 15 alternative activities designed to help teachers tailor the lesson to meet the needs of students.

Single copies of *Robots of Cave Alpha* are 75 cents. The teacher's guide is $2.00. Substantial discounts are available on quantity purchase of both the booklet and the teacher's guide. For more information, write to: Soil Conservation Society of America, 7515 Northeast Ackeny Road, Ackeny, IA 50021 ■

Directory of EE Facilities and Resources in New England

The New England Environmental Education Alliance and Antioch/New England Graduate School are co-sponsoring *A Field Guide to Environmental Education Facilities and Resources*. The directory will include EE centers, sanctuaries and preserves, environmental museums, statewide organizations, nature centers, regional organizations, national parks, and national EE organizations. It will feature comprehensive profiles of organizations, including their programs and activities, staffing, finances, and demographics.

The pre-publication price of the directory is $12.00, a 25 percent discount on its cost of $16.00. For more information, contact: Department of Environmental Studies, Antioch/New England, Roxbury St., Keene, NH 03431 ■

One of two Arctic foxes recently arrived at the Center is still wearing his winter whites.

The Park the Kids Built

Text and photos
by
Kim Nauer
Environmental Intern

The children peered into the cage of the unresponsive possum. All that was visible was a large wooden box with a hint of brown-grey fur toward the back of the black hole.

"He doesn't come out during the day," explained Vinny Lavorgna, assistant ranger at New Haven's West Rock Nature Center. "Why is that? What kind of animal comes out only at night?"

"N...n...n...nighttime," said a young boy, giving up on the other word he had learned.

"No, not nighttime. Now, come on, you guys. I said the word three or four times back there. Can you remember the word?" asked Lavorgna in mock reproval. He reminded them that the word was "nocturnal," and then moved on.

That day, the children had seen a pheasant, a great horned owl, a hawk, a wild turkey, a swan, some geese, and a bobcat, but the best was yet to come.

"These two guys are Arctic foxes," Lavorgna said. He then explained that while most of the animals at the Nature Center are native to Connecticut, the foxes were from a place far more exotic – the Arctic. They were in the process of shedding their white winter coats for summer greys.

More than a Day out of School

In this group were just 20 of the 5,000 students and teachers who come every year to see orphaned an injured wildlife at the Nature Center. As the childr run around the laurel-shaded paths, stopping to tease the surly turkey and pet the deer, it is obvious that they are getting something more than a sunny day out of school.

"They are being sensitized," said Steve Daddona, the head ranger at the park. "Many of these kids have never seen a raccoon, never seen a possum. The program serves a purpose just by showing kids these creatures exist."

But the fact that most of the animals were wounded or orphaned also conveys another message – they are fragile and can be hurt. "They learn to just leave them alone, let them be," Daddona said.

And the students loved it. All the groups do, he said. The Nature Center offers more than the zoo tours. The 40-acre park also has miles of woodland trails to tour. "But, every class, even the ones that come back year after year, wants the zoo tour. The animals are the big thing."

In addition to being a zoo, the park is a hospital. Daddona, licensed by the state and federal government to take care of injured wildlife, is one of a statewide network of wildlife care specialists. "We were inundated this spring," Daddona said. He turned ledger pages full of the names and injuries of animals brought in since January. Of those brought to the center, about half survive. "I think we do OK wh you consider the statistics that are reported," Daddona said. "Forty to 50 percent is considered pretty good, because a lot of them are in bad shape when they get here."

By mid-June, most of the animals were gone. Only a pheasant, a woodchuck, and a racoon litter were left in the dark wooden shed. Others had been released or assigned to volunteers to take care of. "The facilities here are pretty rough, but we have all we need to take care of the animals we get," Daddona said. Generally, they only provide light veterinary medicine and recovery facilities. Care ranges from healing broken legs and wings to raising litters from birth.

Most of the animals that survive are released. Of the 105 animals brought in last year, 60 percent survived and 48 percent were released. The zoo keeps animals that haven't healed properly and wouldn't survive in the wild as well as a few to round out the collection.

The Park the Kids Built

At the park's entrance is a sign: "Welcome to the West Rock Nature Center — The Park the Kids Built." It is not an exaggeration. In 1946, Tony Cosenza, a farmer, came up with a way to develop the new park that New Haven had bought — have young volunteers build the facilities. The city made him ranger and he started the Park Oaks Club. In the 1950s and 1960s, he had 40 to 50 students a day helping him build the sheds, trails, and zoo. They still get people coming back pointing out their work, Daddona said.

While many of the structures have since been rebuilt, the club is still there. Kids, ages 10 to 14, come up on weekends and help maintain the zoo and take care of the animals. The Center also receives intern help from students at Southern Connecticut State University and the local high school.

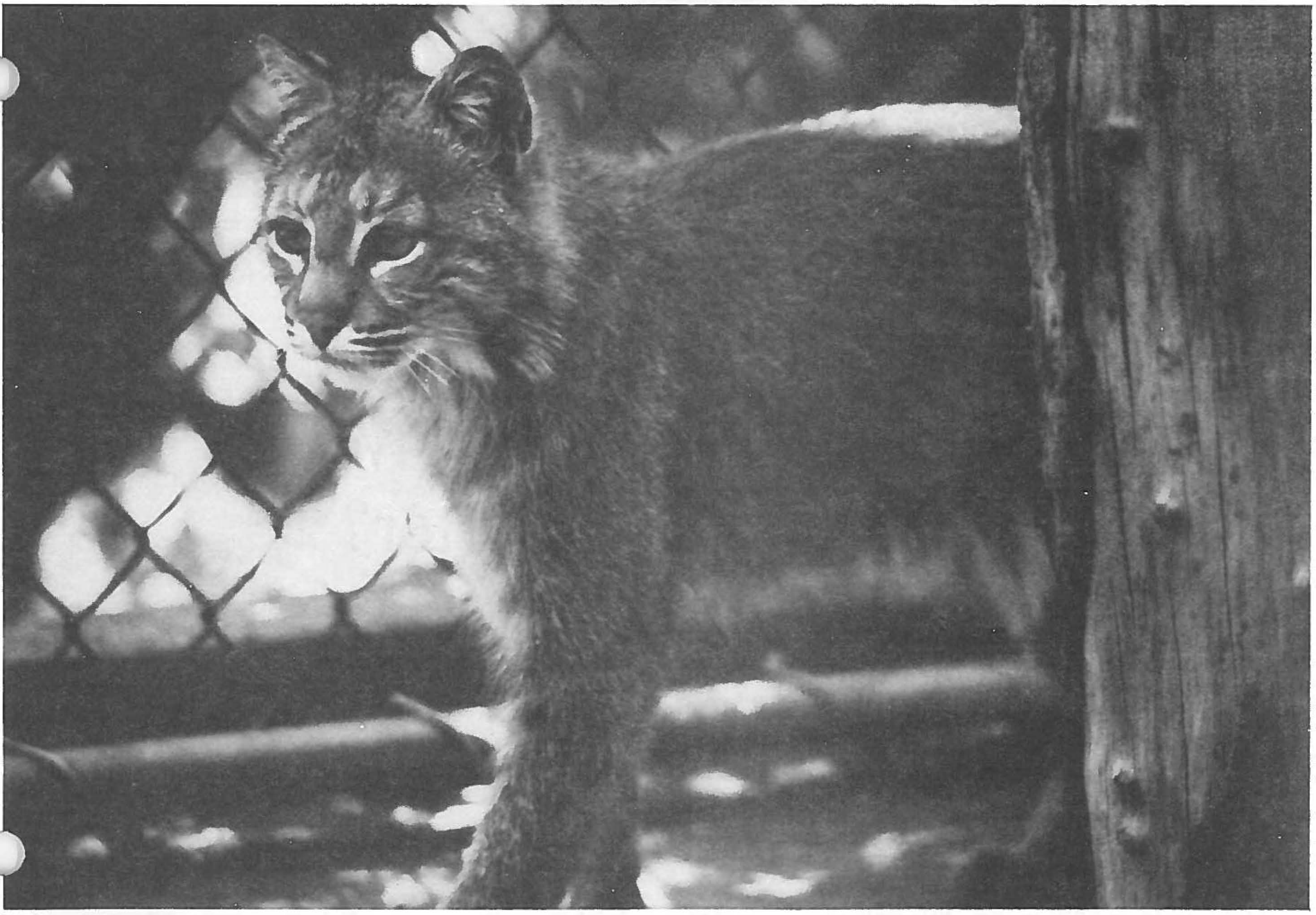
In the spirit of the Park Oaks Club, the students are helping to build a new mammal zoo, as well as planting an organic garden, maintaining the trails, and learning basic farming skills. "It helps me a lot," Dadonna said.

With only four paid staff members, the Center depends on the help it receives from the volunteers. "We wouldn't have to shut down without them, but there would be no time for special projects," Daddona said. The care, cleaning, ground work, and programs would be all they could handle, he said.

The set-up benefits both the staffers and the volunteers, Daddona said, but most of all it benefits the injured and orphaned animals. "Nobody will take them. People call the Humane Society and other places, nobody will take them. But we do."

If you find an injured or orphaned wild animal, call Steve Daddona or Vincent Lavorgna at the Center at 787-8016 or the Wildlife Bureau at 566-4683. ■

The law requires persons to be licensed in order to care for sick or injured wildlife. It is illegal to remove young wildlife from the wild.



Angle the bobcat was orphaned and is now a permanant resident of West Rock Nature Center.

For some species, such as skunks and raccoons, the usefulness of relocation as a solution to nuisance problems is questionable. (*Photos: L.L. Rue*)

Do They Really Live Happily Ever After?

by
Dale May
Staff Associate
Bureau of Wildlife

"Don't kill it, but get it out of here." This is a cry commonly heard from people experiencing a nuisance wildlife problem. To many, relocation appears the ideal solution to their problem; the animal is gone from where it is not wanted and it is placed in an area where it will live happily ever after. However, is this really the case? Let us examine some facts regarding relocations:

1. For virtually every wildlife species in Connecticut, the amount of available natural habitat is declining.

2. Most common wildlife species (which also happen to be responsible for the majority of nuisance complaints) are well distributed and are at or near the carrying capacity of their natural environment. Within these habitats, they maintain population stability by balancing population losses (death, emigration) against gains (birth, immigration). Man-caused disruptions of this equation, in the form of relocations, have predictable consequences.

3. A relocated animal, when introduced into an area fully occupied by conspecifics (others of the same species), must do one of two things to survive: (1) It must displace one of it's competitors, or (2) it must move out of the area. If it chooses to stay, the balance will be maintained either by the death of the relocated animal, or by the death or emigration of one of its competitors.

4. A relocated animal that choses not to compete in its new environment will search out other suitable unoccupied areas. If none are available, the animal will either perish or will again attempt to survive in unsuitable habitat. These animals typically end up in conflict with humans and the nuisance cycle starts all over again.

This is not to say that relocations are not an important tool for the wildlife manager. When dealing with uncommon species for which there exists unoccupied suitable habitat, relocations may be an ideal solution to a nuisance problem (assuming that the animal can be captured). Relocations are also an excellent means of increasing the range and distribution of uncommon species, if this is desired. The reestablishment of Connecticut's turkey and beaver populations can be attributed to relocations.

However, for common species such as skunks and raccoons, the usefulness of relocations as a solution to nuisance problems is questionable. Natural crowding is occurring due to the accelerated loss of natural areas to development. To add to that overcrowding by relocating nuisance animals serves no benefit to the population.

Under these circumstances, perhaps the best solution to nuisance problems caused by common animals is to take measures to avoid nuisance possibilities in the first place. Homeowners in suburban areas should expect problems with skunks in their garbage and raccoons in their chimneys. Construction of a rack for garbage cans or placing a screened cap over the chimney are examples of logical steps that can be taken to reduce potential problems between man and animals sharing the same area.

As natural wildlife habitat continues to shrink, conflicts between humans and wildlife will continue to increase. We should not be so naive to think that the shuffling of individual animals represents a solution to the nuisance wildlife problem. ■

The reestablishment of Connecticut's wild turkey population can be attributed to relocation.

The Bulletin Board

Wild Turkey Sighting

"Wild turkey poults which hatch in the summer, from June through August, are likely to be seen searching for food with the adults in the upcoming months," reports Brian Miller, DEP Wildlife Bureau wild turkey biologist. Sighting reports made to the Bureau will help assess this year's brood production, and are valuable to the state's wild turkey restoration efforts. Postpaid reporting cards are available at many town halls and the Wildlife Bureau, Hartford Office (566-4683). Send reports to: Brian Miller, Franklin Wildlife Management Area, RR 1, Box 241, North Franklin, CT 06254 (or call 642-7239)."

Reports should include: number of young turkeys sighted; number of adults seen with each group of young; the age or size of the young; the location, in some detail, where they were observed; and the date of the sightings.

"Connecticut's wild turkey population has undergone substantial growth since the initial release of 22 birds in 1975," Miller points out. "Newly-established turkey flocks have shown the ability to double their numbers each year, so by now the population has reached a level equal to the land's ability to support it. Even after this level, or carrying capacity, has been reached, the birds' ability to produce at this rate remains in reserve for times of hardship. Currently, 5,000 birds are estimated in the Connecticut population."

Tree Harvesting Report

Tree harvesting activity increased dramatically in Connecticut during the 1970s. Connecticut's forests, which were largely cut-over early in this century, had matured to the point where timber-sized trees were again in abundance. At the same time, demand for oak timber, our most abundant species, increased both here and abroad, and the Arab oil embargoes produced tremendous demands for home fuelwood. By the end of the decade, over 70 million board feet of timber and over 600,000 cords of fuelwood were being cut each year.

A recently-published University of Connecticut Cooperative Extension Service bulletin, *Timber and Fuelwood Use in Connecticut*, takes a look at the trends and impact surrounding harvesting in our state. Questions adressed include: how much wood is being cut in Connecticut, and for what; who is cutting, and where; what is the value of these industries to our rural economy; and what is the impact on our forest resource.

Copies of the 13-page report may be obtained by writing the Agricultural Publications Department, Bulletin Room, Box U-35, University of Connecticut, Storrs, CT 06268.

Soil Symposium

Copies of *Proceedings of the Society of Soil Scientists of Southern New England Symposium on On-Site Sewage Disposal* are available for purchase. This symposium was held at the University of Rhode Island on March 31 - April 1, 1986. Co-sponsors were the U.S. Environmental Protection Agency, U.S.D.A. Soil Conservation Service, and the Universities of Connecticut, Massachusetts, and Rhode Island.

The cost of this publication is $12.50 per copy. Interested persons should write to the Society of Soil Scientists of Southern New England, P.O. Box 258, Storrs, CT 06268.

World Record Catfish

A 12-pound, 4-ounce white catfish, believed to be a new world record, was caught on July 6 by Richard S. Junokas of Newington. Junokas was using eight-pound test line while fishing for largemouth bass in Great Hill Pond in Portland when the catfish struck his spinner bait lure. The catfish caught by Junokus is believed to be a new world record in the eight-pound test line class. The current record is 7 pounds, 13 ounces, set during 1984 on a catch from the Connecticut River in Massachusetts. Junokas will be applying to both the Fresh Water Fishing Hall of Fame and to the International Game Fish Association for official world record recognition. Data in DEP files indicate that the all-tackle world record for the white catfish is 15 pounds, 15 ounces. That fish was taken in 1982 from Walthall Mill Pond, Virginia. The catch is of course a new state record, surpassing the previous record of 9 pounds, 13 ounces set in 1973.

Environmental Conference

On October 8, 1986, a conference on "Environment/2000 — Connecticut's Environmental Goals and Management Strategies" will b held at the Ramada Inn in Meride As *Citizens' Bulletin* readers know, the Environment/2000 report represents the state's environmental agenda for the next 15 years. This conference will provide Connecticut's citizens with a unique opportunity to determine the state's environmental programs, direction, and priorities.

The conference will be held at the new Ramada Inn in Meriden, from 9:00 a.m. to 4:00 p.m. Speakers will include Governor William O'Neill. A registration fee of $15.00 will cover the cost of coffee, lunch, and written materials. If you would like to attend, or if you need more information, contact Tessa Gutowski at 566-7049.

Trailside Botanizer

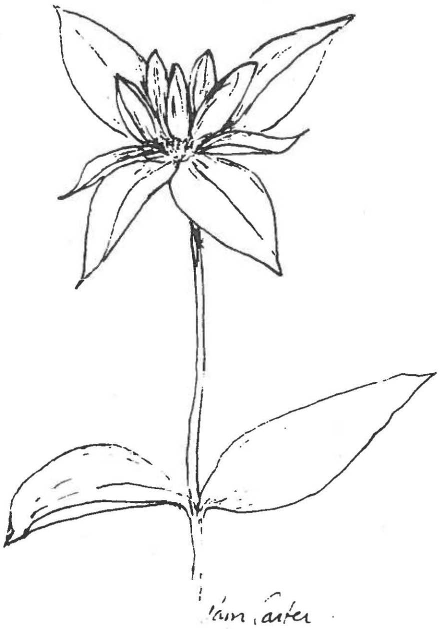
Bottle Gentian

by
Gale W. Carter
Drawing by
Pam Carter

The discovery of a stand of bottle gentian is always a special treat. This is particularly true in September, when the days are becoming shorter and the possibility of frosty nights approaches. Look for this species in wet meadows and along moist, shady roadsides.

Bottle gentian has a dark blue flower with a tube-like corolla which is closed at its tip. A white fringed membrane extends slightly beyond the closed petal tips in this species. The flower clusters are stalkless and appear either as terminal clusters or in the upper axils of the leaves. Blossoming time is August to October.

© 1986, Gale W. Carter



This species has lance-like, toothless leaves. They are opposite near the bottom of the plant and whorled near the flower cluster. The height of bottle gentian may vary from one to three feet.

It has long been believed that the closed gentian was self-fertilized. This now seems unlikely, based on a knowledge of the stamens and pistil. In addition to this, the stamen and pistil mature at different times. Through personal observation, it has been learned that bees are attracted to this blue flower. They have been seen tearing open the closed petals. In her book, *How to Know the Wildflowers*, Mrs. William Starr Dana compares this action to forcing our hand into a closed bag of peanuts.

The species name of this gentian (*gentiana andrewsii*) is in honor of Henry Andrews, a 19th century English botanical artist and engraver.

The generic name, *gentiana*, comes from the name of the Illyrian king, Gentius, who discovered the medical values of the root of the gentian. It was used as a tonic to stimulate the appetite and to help with digestion. The Catawba Indians boiled the plant in hot water to obtain an extract for a compress to relieve backache. ■

Letters to the Editor

Your publication engenders respect in us all for the natural environment and the necessity for us to live in harmony with and to stop offending nature. Keep up this most important work.

Peter Rutter, M.D.
San Francisco

We are very pleased with the variety of informative articles and feel that the *Bulletin* has become more interesting to the general public during the last year.

E. and W. Miska
Newington

Since I've subscribed to the *Bulletin* I've learned a lot about Connecticut that I didn't know, and would not know unless I read it in the *Bulletin*. Keep up the good work. Thank you especially for news on current legislation.

Walter J. Kania
Danielson

In our area of limited newspaper coverage, the *Citizens' Bulletin* is a most welcome source of information and reassurance that we the people collectively care about threats to our environment. Have any studies been done on the effect of noise on our environment?

Isabel S. Fairchild
West Hartford

We have an article on noise pollution in the works right now. In the meantime, please contact DEP Noise Control Program, 122 Washington St., Hartford 06106, phone 566-7494. Ed.

Readers are invited to share their views on current environmental matters. Please let us know what you think. Letters should be no more than 250 words, and are subject to editing. Please include phone number for verification.

Endnote

The man we call modern, the man who is aware of the immediate present, is by no means the average man. He is rather the man who stands upon a peak, or at the very edge of the world, the abyss of the future before him, above him the heavens, and below him the whole of mankind with a history that disappears in primeval mists. The mere fact of living in the present does not make a man modern, for in that case everyone at present alive would be so. He alone is modern who is fully conscious of the present.

C. G. Jung

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